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Article 29 of the Regulation (EU)
No 305/2011 of the European Parlia-
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2011

MEMBER OF EOTA

European Technical Assessment ETA-22/0333 of 2023/06/12

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

STRUKTRA TBF, TBK and TBL Structural Thermal Breaks

Product family to which the above construction product belongs:

Thermal insulation elements of fibre-reinforced polymer which form a thermal break between structural elements

Manufacturer:

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This European Technical Assessment contains:

9 pages including 1 annex which form an integral part of the document

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

European Assessment Document – EAD 041877-00-0301 for Thermal insulation elements of fibre-reinforced polymer which form a thermal break between structural elements

This version replaces:

The ETA with the same number issued on 2022-06-08

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

The thermal insulation elements are made from fibre-reinforced polymer which form a thermal break between structural elements (in the following referred to as “the element”) is a structural thermal break plate made from fibre-reinforced polymer.

The thermal insulation elements are bolted, through fixed or clamped between flanged connections of internal and external steelwork, or internal concrete and external steelwork.

STRUKTRA TBF, TBK and TBL Structural Thermal Breaks are synthetic, structural thermal break plates as follows:

- STRUKTRA TBK: a glass-fibre laminate, bound with a high-temperature polymer resin laminate
- STRUKTRA TBL: modified polyamide thermoplastic.
- STRUKTRA TBF: a inorganic mineral composite containing Mica and silicon resin

The products’ characteristics and the available thicknesses are shown in annex A

The following accessories are to be used with the products but outside the scope of this ETA:

- Structural supporting elements — steelwork, concrete etc
- Stainless steel bolts.

Dimensions, hole positions and typical installations are shown in Annex A and B.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

The intended use of the load-bearing thermal insulation elements of fibre-reinforced polymer is to reduce the thermal bridging between flanged connections of internal and external steelwork or internal concrete and external steelwork. The load-bearing thermal insulation elements of fibre-reinforced polymer transmits compressive forces arising from the structural action of the connection.

The element is intended to be subjected to static or quasi-static loads only and is not intended to resist shear or tensile force.

The element is not intended to be subjected to exposure from weathering/humidity.

The products are used in the construction of new-build and refurbishment projects such balconies, façade system connections, Brise-soleil and canopies, external access systems (staircases, balustrading, etc), roof plant room super-structure (columns), connections between new and existing construction, Building Maintenance Units (BMU)

The provisions made in this European Technical Assessment are based on an assumed intended working life of the hold-downs of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

Characteristic

Assessment of characteristic

3.1 Mechanical resistance and stability (BWR 1)

Compressive strength and modulus of elasticity

Product Type	Characteristic compressive strength, $f_{ck}(1)$ (N/mm ²)	Modulus of elasticity (N/mm ²)
STRUKTRA TBK	312	5178
STRUKTRA TBL	89	2586
STRUKTRA TBF	355	5326

Creep

Product Type	Long term creep deformation %
STRUKTRA TBK	20
STRUKTRA TBL	30
STRUKTRA TBF	20

3.2 Safety in case of fire (BWR2)

Reaction to fire

Product type TBK and TBL are classified as **class E** in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364. The classification applies for construction applications mechanically fixed over any substrate having a minimum thickness of 0,6 mm, a minimum density of 5850 kg/m³ and a fire performance of A1. The classification applies to all thicknesses covered by the ETA, but not other deviations.

Product type TBF are classified as **class A2-s1, d0** in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364. The classification applies for construction applications mechanically fixed over any substrate having a minimum thickness of 0,8 mm, a minimum density of 7800 kg/m³ and a fire performance of A1. The classification applies to all thicknesses covered by the ETA, but no other deviations.

3.3 Energy economy and heat retention (BW82)

Thermal conductivity

Product	Thermal conductivity λ (W/mK)
STRUKTRA TBK	0,187
STRUKTRA TBL	0,292
STRUKTRA TBF	0,200

Characteristic**Assessment of characteristic****3.4 Related aspects of serviceability**

Flexural strength

Product	Flexural strength MPa			
	Initial	2 hours boiling	After 80°C for 50 days	After 80°C for 100 days
STRUKTRA TBK	148,4	182,1	127,2	112,2
STRUKTRA TBL	No performance assessed			
STRUKTRA TBF	No performance assessed			

Water absorption

Product	Water absorption, %
STRUKTRA TBK	0,14
STRUKTRA TBL	0,48
STRUKTRA TBF	0,40

3.5 General aspects related to the performance of the product

The thermal break plate does not contribute to shear resistance but introduces bending on the bolts by virtue of the gap created. Therefore, a thermal break plate in a connection must be considered as a 'pack' in terms of connection design. Where packs are used in connections, and depending on the thickness of the packs, it may be necessary to reduce the shear resistance of the bolts within the connection in accordance with EN 1993-1-8.

Assessment of structural performance for individual installations of connections that include thermal break plates should be carried out by a suitably experienced and qualified engineer and designed in accordance with EN 1993-1-8, taking into account the following aspects:

- the thermal break plate can resist the applied compression forces
- any additional rotation due to the compression of the thermal break plate (including allowance for long term creep) is adequate
- the shear resistance of the bolts is acceptable given that there may be a reduction in resistance due to packs and large grip lengths
- for non pre-loaded bolt systems, the shear resistance of the bolts is adequate.

4 Attestation and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 98/214/EC of the European Commission, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2023-06-12 by



Thomas Bruun
Manager, ETA-Danmark

Annex A Product details definitions

The products' characteristics and the available thicknesses are shown in Table 1.

Table 1 Product characteristics

Product	Thickness (mm)	Material Density (kg/m ³)	Colour
STRUKTRA TBK	5, 10, 15, 20, 25	1355-1500	Amber
STRUKTRA TBL	5, 10, 15, 20, 25	1100-1175	Black
STRUKTRA TBF	5, 10, 15, 20, 25	2140-2170	Grey

A typical detail of a TBK thermal break plate is shown in Figure 1.

Figure 1 STRUKTRA TBK plate – steel to steel connection

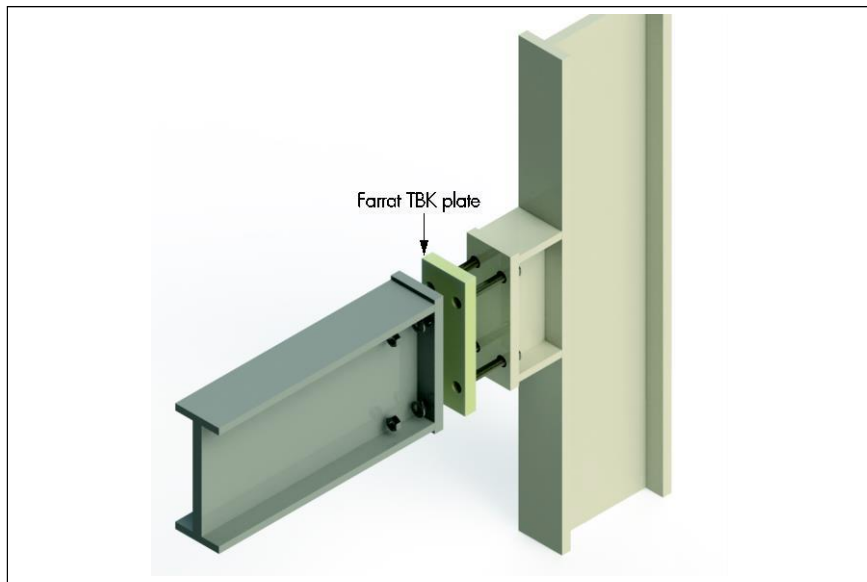


Figure 2. Typical example applications of STRUKTRA TBF, TBK and TBL Structural Thermal Breaks

